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PM

TECHNOLOGY UPDATE



USDA Forest Service
Forest Pest Management
Methods Application Group

Issue No. 90-02
September 1990

Resource Technology 90

The Second International Symposium on Advanced Technology in Natural Resource Management - Resource Technology 90 - will be held November 12 - 15, 1990, at the Georgetown University Conference Center, Washington, D.C.

Resource Technology 90 (RT-90) will highlight the worldwide concern for applying new technology to the pressing issues confronting our diminishing natural resources. The symposium will feature over 100 papers, presented by speakers from around the world, on the integration of

these new technologies among various natural resource disciplines. Workshops on Geographic Information Systems, Artificial Intelligence, Integrated Systems, and Remote Sensing, as well as an integrated commercial exhibit area, are also on the RT-90 schedule.

RT-90 is sponsored by 13 organizations. These are Andersen Consulting, Hewlett Packard Company, NASA, NOAA, USDA Forest Service, USDA Soil Conservation Service, USDI Geological Survey, USDI Fish & Wildlife Service, USDI Bureau of

Land Management, USDI National Park Service, U.S. Environmental Protection Agency, United States Agency for International Development, and Industrial Technology Research Institute in Taiwan.

For more information, see the schedule below, or for a preliminary program and registration form, call Janette Evans at (303) 226-1688 or write to: Janette Evans, Conference Coordinator, Resource Technology 90, 2625 Redwing Road, Drake Executive Plaza, Suite 120, Fort Collins, CO 80526-2878.

RT 90 Schedule

Event	Deadline	Price
Early Registration	Now-Oct. 22	\$250/person (includes banquet ticket)
Full Registration	Oct. 22-Nov. 12	\$300/person (no banquet ticket)
*Student Registration	Now-Nov. 12	\$50/person (no banquet ticket)
Technical Workshops (Monday afternoon)	Now-Nov 12	\$20/person/workshop
Banquet (Wednesday evening)	Now-Nov. 12 (or while supply lasts)	\$25/person

* Students can mail registration forms and payment now, but must show current student identification when checking in at the conference on November 12.

People registering during early or full registration will receive conference proceedings when they are published after the conference.

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Quantitative Techniques Program

Permanent Plot Accomplishments

FPM field units have nearly completed the first year of the FPM project on western permanent plots. This project is intended to build and standardize the data base on long term pest behavior by cataloging all existing permanent plot systems (FPM and non-FPM) which include pest data, and by augmenting the existing systems with new plots as necessary. Currently the project is focusing on mountain pine beetle, dwarf mistletoe, root disease, and western spruce budworm. Field units have collected data on existing plot systems, and pest coordinators have developed standard guidelines for the installation of new plots. MAG will compile the data on existing systems into a data base and report, which will be updated periodically. Next summer, field units will begin installing new plots as required. The benefits of this project will be increased ability to develop, calibrate, and update pest models.

Douglas-fir Tussock Moth Model Update

Cooperators from Intermountain Station, Region 6, Region 5, and MAG met last January to discuss possible modifications of the existing Douglas-fir Tussock Moth (DFTM) Model. The DFTM Model consists of two components, one dealing with population dynamics and defoliation as a function of available food, and one which relates total tree defoliation to tree mortality, growth loss, and top kill. The weakness of the model is the linkage of these two components, which relates midcrown defoliation to total tree defoliation. MAG's conclusion (based on analysis of available data) is that this relationship is inherently very weak; i.e., even if we have perfect knowledge of midcrown defoliation, it is still a very poor predictor of total tree defoliation. The project is proposed to continue in the next fiscal

year. Cooperators will be collecting more data on the DFTM, as well as exploring the possibility of modifying the population part of the model to address defoliation in top, middle, and lower crown thirds (similar to the western spruce budworm model), thus avoiding dependency upon a midcrown-total tree defoliation relationship. DFTM populations are growing in parts of the west, as is interest in a revised DFTM model. Anybody interested in participating in this study, or anyone having DFTM data available, is invited to contact Bov Eav at MAG.

Forest Health Monitoring

The joint Forest Service-Environmental Protection Agency Forest Health Monitoring (FHM) initiative is gaining steam. This summer saw the first implementation of FHM under the co-leadership of Margaret Miller-Weeks of FPM-NA and Bob Brooks of NE-FIA (Northeastern Experiment Station-Forest Inventory and Analysis). The project addresses six New England states, and is expected to address more northeastern states in the next season. FPM will include the south next summer, with leadership provided by Bob Anderson of FPM-R8. Forest Health Monitoring is likely to include parts of the west by FY 92, and the entire continental United States by 1995. FPM has a major role in FHM, addressing items such as identifying pests on permanent plots and on photo plots, training field crews to recognize these agents, and developing the National Reporting System to integrate all of our pest status information into one data base which may then be used to study changes in forest health. The idea is that, before we attempt to identify areas where health is changing because of possible human-caused reasons, we must first identify how much of the measured change is due to known agents, such as pests. Copies of a Denver FIA-FPM-EPA meeting report on the National Design of Forest Health Monitoring are available from MAG upon request. This

document includes a basic introduction to the objectives, organization, and long term plans of FHM.

For information on Permanent Plot Accomplishments, DFTM Model Update, and Forest Health Monitoring,

CONTACT: Bov Eav
TELEPHONE: (303) 498-1784
DG: B.Eav:W04A
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NAPIAP Database Project

MAG is in the final stages of developing an ORACLE database to more efficiently track pesticide projects funded under the National Agricultural Pesticide Impact Assessment Program (NAPIAP). WO-FPM toxicologist, Zdenka Horakova, is the Forest Service coordinator for this project and will be using the database on W01C. Previously, project proposals were kept only as hard copies. The NAPIAP database will allow electronic input of data and query/report output. A temporary database was installed in June 1990 to accomplish the initial data entry of all proposal documents accumulated from 1978 through 1989. The permanent database, to be installed by October 1990, will contain all historic NAPIAP proposals. It will offer menu driven user access to create new proposals in the database and process edits, views, queries and reports on the entire database.

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Quantitative Techniques Program

Dwarf Mistletoe Modeling Workshop

In May of this year MAG sponsored a dwarf mistletoe modeling workshop to develop a modeling plan that, when implemented, would produce dwarf mistletoe management models for the western United States. The workshop was held in Fort Collins, Colorado, and was conducted by Environmental and Social Systems Analysts Ltd. (ESSA). Participants at the workshop were involved in dwarf mistletoe research and management issues in the western United States and represented Regions 1, 2, 4, 5, and 6 Forest Pest Management, Washington Office Timber Management, the Deschutes National Forest, Regions 1 and 6 Timber Management, the Rocky Mountain Research Station, Oregon State University, Utah State University, and MAG.

The workshop participants (1) defined the scope of a comprehensive dwarf mistletoe model, including management actions, model output indicators, spatial extent and resolution, and temporal extent and resolution; (2) assessed the adequacy of existing models and data; and (3) defined additional work needed to develop a comprehensive dwarf mistletoe model, including field research, data analysis, and modeling.

Development of a comprehensive mistletoe model as defined and scoped by the workshop participants requires completion of the following eight tasks:

1. develop a tree mortality modification model for dwarf mistletoe effects;
2. develop a tree growth modification model for dwarf mistletoe effects;
3. develop a dwarf mistletoe spread and intensification model;
4. develop a model of changes in tree and stand broominess and

stand abundance of spiked tops arising from mistletoe infection;

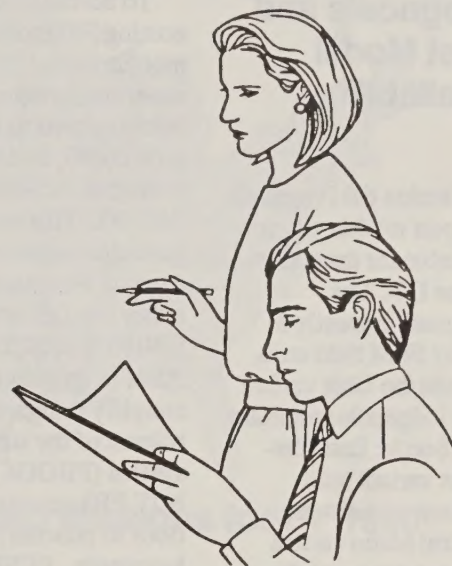
5. modify the existing stand development models to more realistically simulate mistletoe dynamics;
6. link the mistletoe models with existing stand development models, along with appropriate stand development model keyword implementation;
7. define changes (if necessary) to dwarf mistletoe and stand inventory procedures to use the models;
8. develop appropriate user documentation and training for the models.

A more detailed description of the eight tasks, as well as other results of the workshop, are documented in the report entitled "A Modeling Plan for Dwarf Mistletoe: Results of a Workshop" prepared by ESSA.

The first two tasks in the workshop, developing the mortality and growth modification models, were viewed by participants as having the highest priority. To address these tasks, MAG is developing an interim integrated mistletoe/stand development model for silvicultural planning. This work began in July 1990 with funding from Regions 1, 4, 5, and MAG.

MAG will concentrate on seven of the most economically important tree species: interior ponderosa pine, coastal ponderosa pine, lodgepole pine, Douglas-fir, true firs, western larch, and western hemlock.

The Technology Development Project Task Force submitted a proposal for funding to the Director of Forest Pest Management to develop the comprehensive Dwarf Mistletoe Model. If approved, the project will start in October 1990 and will produce a comprehensive model by September 1993.



Upcoming Pest Model Training Session

MAG, with assistance from Washington Office-Timber Management, Intermountain Station and Rocky Mountain Station, will conduct a Prognosis-Pest Model training session on October 16-18, 1990, in Fort Collins, Colorado. The purpose of the session is to train FPM field personnel to be "POWER USERS" of pest impact models maintained by MAG.

The agenda for the session includes a general Prognosis overview, introduction to the submittal system, interpretation of Prognosis output, orientation to variants of Prognosis, status of pest impact models, and complete training in the mountain pine beetle, western spruce budworm, dwarf mistletoe, and western root disease models, and in the pest model submittal system. The training will also include hands-on exercises and an open lab session.

For a copy of the dwarf mistletoe workshop report or information on pest model training,

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Quantitative Techniques Program

Prognosis and Pest Model Availability

Version 6.0 Prognosis and pest models are now available for execution on the DG. Test programs currently in use by FPM field units include the Utah variant with lodgepole mountain pine beetle; East Cascades variant with western root disease; Central Idaho variant with western root disease, western spruce budworm, or lodgepole mountain pine beetle; and Blue Mountain variant with western root disease or lodgepole mountain pine beetle. All other Prognosis variants with appropriate pest model extensions are also possible on the DG, and will remain available at NCC-FC on the UNISYS, with future conversion planned to IBM.

To accommodate executing Prognosis/pest models on the DG, the submittal system has been updated to Level 3:06:09:90, and became available for RISing on 9/10/90. This version generates runstreams for running Prognosis on either the DG or the UNISYS at NCC-FC. Also, in an effort to simplify things, the new release of the submittal system (PROG6_SUBMIT.PR) contains all options to process pest keywords. PEST6_SUBMIT.PR is now incorporated into this base submittal system program and therefore is no longer available for RISing. Level 5 submittal system programs (PROG_SUBMIT.PR and PROG_PEST.PR) which created runstream for Level 5 Prognosis/pest models have also been removed from retrieval.

Users wanting to run Prognosis and pest

models on the DG will need to (1) obtain a copy of the desired Prognosis/pest executable program, (2) have data stored on the DG, and (3) retrieve Level 3:06:09:90 of PROG6_SUBMIT.PR submittal system program (optional use). WO-TM and MAG require that all Prognosis/pest program requests are made through the Regional Prognosis contacts listed below. This will ensure that Bulletin and code with model updates are passed on to users, and that Regional information management guidelines for processing on the DG are followed.

CONTACT:

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FTS: 323-1727

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Vacant,
Biometrician (2 positions)

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Manager (303)498-1778

Carl Sumpter, DG:C.Sumpter:W04A
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Technician

Systems Development
Patrice Janiga, DG:P.Janiga:W04A
Manager (303)498-2311

Laura Disbrow, DG:L.Disbrow:W04A
Program (303)498-1724
Analyst

Vacant,
Computer Specialist (2 positions)

The Forest Pest Management Methods Application Group publishes Forest Technology Update semi-annually and distributes it nationally to FPM personnel and others interested in forest pest management. The newsletter seeks to link FPM/MAG with field personnel and inform them of program activities and status, model availability, upcoming models and their release dates, and current related news. It is available on request to anyone interested in forest pest management. We invite your comments and suggestions on how we can keep you informed and better serve you. Items of interest and comments should be sent to:

Keri Webster
FPM Methods Application Group
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Fort Collins, CO 80524
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Prognosis Contacts:

	Person	FTS Phone	Comm Phone	DG address
Region 1	Jim Brickell	585-3158	(406)329-3511	R01A
Region 2	Dan Greene	776-9547	(303)236-9547	R02A
Region 3	Dick Bassett	476-3480	(505)842-3480	R03A
Region 4	Bob Cottingham	586-5534	(801)625-5534	R04A
Region 5	Ralph Warbington	465-2545	(415)705-2545	R05A
Region 6	George Lightner	423-3339	(503)326-3339	R06C
Region 10	George Rogers	871-7913	(907)586-7913	R10A

Other contacts, all Regions:

Gary Dixon, WO-TM	323-1814	(303)498-1814	W04A
Janette Savidge, FPM/MAG	323-1727	(303)498-1727	W04A

Remote Sensing Program

FPM Remote Sensing Workshop Scheduled

MAG is tentatively scheduling a remote sensing workshop for the week of February 4, 1991, in Fort Collins, Colorado.

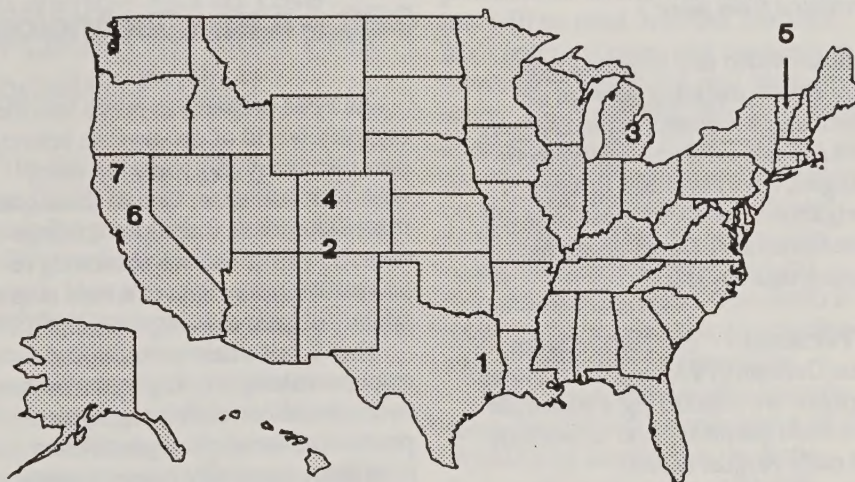
A need for the workshop was expressed in the FPM Working Group meeting held during the national Forest Service Remote Sensing Conference on April 9-13, 1990, in Tucson, Arizona. The Working Group agreed that a FPM remote sensing workshop to address specific FPM needs is needed in alternate years from the biennial Forest Service/Remote Sensing Conference. The Tucson group of 20 people representing various FPM units formed a list of topics for a 1991 FPM/Remote Sensing Workshop, including:

- direction of GIS in FPM
- linkage of Remote Sensing and GIS
- future of sketch mapping
- airborne video development updates
- Global Positioning System (GPS)
- role of Remote Sensing in Forest Health Monitoring
- applications of satellite technology in FPM

Comments and suggestions regarding topics are requested from all FPM units (e.g., are these topics still viable, additional topics to be included, etc.) by December 1, 1990.

Several FPM units have expressed interest in a workshop on the fundamentals of the airborne video system, video image acquisition, and image processing. Therefore, a one to two day workshop is planned to follow the FPM/Remote Sensing Workshop for individuals wishing to combine both workshops in one trip. More information will be sent to all FPM units as plans are developed.

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DG: D.Myhre:W04A
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Aerial Photography and Video Missions for FY 1990 Come to a Close

The Remote Sensing Program at MAG was involved in a variety of aerial photography missions in fiscal year 1990. Remote Sensing uses the FPM aircraft, a Beechcraft Queen Air, in all of its missions. The aircraft's purpose is twofold; it provides aerial photography support to Regional and Northeastern Area FPM units, and it serves as an airborne platform to support remote sensing developmental activities. The following mission descriptions correspond to the map shown above.

1. Texas - An airborne video feasibility test flight was flown in October 1989 over a portion of the Davy Crockett National Forest. Video imagery proved successful for detecting and mapping southern pine beetle spots, and the imagery was used to develop special computer software for capturing, mosaicking, and georeferencing video frames. In June 1990 video demonstration flights were done in east Texas to show the utility of video as a management tool for red cockaded woodpecker versus southern pine beetle control operations, and for detecting oak wilt damage. This was a joint effort between Region 8/FPM, National Forests in Texas, Texas State Forest Service, and MAG.

2. Colorado - In June an aerial photo mission was flown on the Southern Ute Reservation in Colorado for Region 2/FPM and the Bureau of Indian Affairs, and on the Apache Reservation in New Mexico for Region 3/FPM. Color infrared photography was acquired over both areas to evaluate root disease problems.

3. Michigan - The Remote Sensing group acquired airborne video imagery and aerial photography over an area in central Michigan in early July to support a study to assess the use of video for detecting and mapping gypsy moth defoliation. In a joint effort, the Northeastern Area (St. Paul)/FPM and MAG will compare video to sketch mapping and aerial photography. Image interpretation and analysis will be performed through a cooperative agreement with Colorado State University.

4. Colorado - A developmental mission was flown on the Uncompahgre National Forest in July. A variety of remote sensing data/imagery (aerial-photos, video, LORAN, and GPS) was acquired to support a study being conducted by MAG with Region 2/FPM's Gunnison Service Center. The study has a number of objectives: (1) to

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Remote Sensing Program

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evaluate video as a tool to supplement sketch mapping surveys for mountain pine beetle, (2) to compare LORAN and GPS navigation technologies, (3) to evaluate linkage of navigation systems to video, and (4) to demonstrate linkage of remote sensing data to GIS.

5. Vermont - - The Northeastern Area(Durham)/FPM and the State of Vermont are conducting a statewide hardwood health survey. In late July and early August MAG photographed approximately 170 photo plots located on a grid design. This is a resurvey of the original 1985 hardwood survey.

6. California - - In August a joint developmental mission was conducted with the Nationwide Forestry Applications Program (NFAP) located in Salt Lake City, Utah. The test sites for this activity were on the Tahoe National Forest. The purpose of this test mission was to evaluate airborne video and scanner technologies for a variety of resource concerns. The airborne video equipment used is the system being developed by MAG, and the scanner/image processing equipment is a prototype multi-channel scanner system being developed by ITRES Research located in Calgary, Alberta, Canada. A special mounting system was built in the Queen Air to accommodate both the video camera and the Canadian scanner, which allowed for simultaneous data/imagery acquisition. To support the video and scanner imagery, 9x9 color infrared aerial photography was also acquired.

7. California - - Region 5/FPM requested MAG's support in acquiring aerial photography of 235 permanent plots distributed across 13 national forests in California. These plots are used to assess pest activity and drought conditions within the state. The photo mission began in late August and is still in progress.

GPS - A New Technology for FPM Applications

As FPM prepares to move into the complex world of geographic information systems (GIS), there are many questions that arise. One of these questions that affects forest pest management is, "How can we accurately relate aerial survey data to a base map to update the pest coverage within GIS?"

This is not a new problem for resource managers. Anybody that has ever tried to correlate geographical position of aerial photography to a base map, especially imagery taken over a forested area with no topographical references (roads, streams, meadows, etc.) visible, has found the task difficult. Photos could have been taken anywhere on the forest, thus "trees are trees". The same thing occurs with airborne videography, and in some instances is more accurate.

Over the years various methods have been tried to solve the problem. Many involved the use of aircraft navigation techniques, specifically long-range navigation systems. These systems ranged from simple ARNAV (VOR/DME) to expensive inertial navigation (INS). Of the systems available LORAN-C is used most often, mainly because of its relative low cost and availability. The accuracy of these systems is quite variable, INS being the best with a .1 nautical mile (nm) error. LORAN-C provides accuracy levels up to .2 nm in areas of prime reception, and in the mid-continent gap the error can be greater than 3 nm. This is great for aircraft visual navigation but not for correlating aerial imagery. All of these systems were land based navigational aids subject to power failures, interference and noise from many sources that affected the accuracy level of the signal.

A new navigation system is now available that surpasses all other systems. This system is not limited to aircraft or marine use, but can be used in the field to locate geographical position. This system is the Global Positioning System, more commonly referred to as GPS. GPS is a Department of Defense project which provides 24 hour all-weather coverage that is impervious to jamming and interference. GPS consists of a constellation of 24 satellites (4 satellites per orbit with 6 inclined orbits) circling the earth at an altitude of 12,600 miles. GPS can provide accuracy levels to millimeter (mm), centimeter (cm) and meter (m), depending upon

the application and technique used. For most FPM applications meter accuracy is suitable, and in certain cases centimeter accuracy is desirable.

It should

be noted that the system is not yet fully operational as only 14 satellites are currently deployed, with optimal coverage concentrated over Yuma, AZ. Also, the military has implemented "selective availability"--the intentional degradation of the satellite signal. This causes the accuracy level to decrease from 25 meters to 100 meters when using one receiver unit. There is no decrease in accuracy when using 2 or more receiver units, but a special technique is required.

In conjunction with the continuing airborne video development, the remote sensing group in MAG is presently testing and improving the linkage of GPS to airborne video. In preliminary evaluations it has been shown that GPS data can be linked

See GPS on page 9

"How can we accurately relate aerial survey data to a base map to update the coverage within GIS?"

Systems Development Program

INFORMS Implemented in Texas

MAG is participating with Region 8, FPM, and Texas A & M University's STARR (Systems Technology and Renewable Resource) lab to develop an INFORMS prototype (INFORMS-TX) for the National Forests in Texas. The goal of the project is to aid implementation and monitoring of the land management plan through project level planning.

Beginning with the Neches Ranger District, INFORMS will integrate spatial and tabular data with knowledge-based systems and simulation models under a standard user interface. It will also assist project analysis and documentation to support consistent decision making.

INFORMS-TX is progressing as planned. The STARR lab's workplan objectives have been completed and include:

- defining the design principles and development methods
- layout of INFORMS-TX system framework
- selecting INFORMS-TX platforms
- establishing ORACLE database
- porting of COMPATS simulation system
- developing silvicultural prescription rule bases

This model will help identify and demonstrate methods for linking models with ORACLE. The COMPATS system, which is a part of INFORMS-TX, uses ORACLE extensively to support user interaction with models and data access and management for models.

During the upcoming year MAG will be working with Region 8 to develop long range implementation plans for INFORMS-TX and other FPM sponsored system development projects.

LaGrande RD to Use INFORMS for Multi Pest Modeling Project

The Systems Development Program (SDP) and the Quantitative Techniques Program (QTP) are supporting the Region 6 Multi Pest Modeling Project. This project is designed to use INFORMS to support the technology transfer of pest models for the LaGrande Ranger District, Wallowa-Whitman National Forest. The case study used to develop data for the models and to test implementation of INFORMS is the Five Points Environmental Impact Assessment. Pest models being implemented in this project include the Mountain Pine Beetle, Western Root Disease, Western Spruce Budworm, and Douglas-fir Tussock Moth. Other models being refined for use on the LaGrande District are the Wallowa-Whitman Sediment (modified Region 1 Sediment), Wallowa-Whitman Fish Model, and the Blue Mountain Elk Model. This project will also produce revised documentation for the DG version of INFORMS.

The Quantitative Techniques Program assisted in planning and reviewing the pest survey being conducted to support the existing and planned models associated with the project. The QTP is also working with the Rocky Mountain Experiment Station to develop a Douglas-fir Bark Beetle Model and define appropriate means to model interactions between pests.

INFORMS Demo Trainer to Debut at RT 90

The first phase of the INFORMS Demo-Trainer software system developed by MAG and Texas A&M's STARR lab will make its debut at an exhibit during Resource Technology '90, November 12-15, in Washington, DC.

This project is part of the overall INFORMS development plan. The demo will be a computer graphics

presentation of INFORMS software that will be used to solicit feedback from potential users and cooperators involved in integrated pest management. The demo will help FPM staffs communicate with the Systems Development Program staff working on INFORMS. It will also expose FPM personnel to new technology being developed to aid in natural resource management. The demo is expected to be available for distribution to field units in November.

FPM personnel can also become more familiar with applications of INFORMS by stopping at the Butte Ranger District poster exhibit at Resource Technology '90.

Jack Pine Budworm DSS Prototype Developed

Cooperators in the Jack Pine Budworm Decision Support System (JPBWDSS) have developed a prototype JPBWDSS for the Hiawatha National Forest in Michigan. The prototype has been reviewed by the JPBWDSS steering committee. Thirty years of jack pine budworm data and weather data coinciding with the budworm survey area have been collected and the Forest Service and Forestry Canada will analyze this information. Cooperators delivered growth and yield equations and an economics package to Texas A & M, which the STARR lab evaluated for use in JPBWDSS. The STARR lab has also completed a preliminary literature search for jack pine budworm and expert systems, and investigated computing environments for demonstration sites in the United States and Canada.

The STARR lab is currently documenting data availability and management alternatives to develop a data format as the foundation for the JPBWDSS. The lab is also investigating the current state of systems technology and the most appropriate database structure.

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Systems Development Program

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The goal of the JPBWDSS is to develop a computerized decision support system that will assist pest specialists and foresters in managing jack pine budworm and affected forest resources. JPBWDSS is a cooperative project involving collaborators from Forestry Canada, USDA Forest Service, Michigan, various provinces, and Texas A & M University.

Pest Information Management System to be Developed for FPM

An Advanced Technology Task Force (ATTF), with representatives from the Forest Service, the Petawawa National Forestry Institute, and Texas A & M University, met in July 1989 to discuss information management for FPM. In October, a smaller core team

met and produced a report, released in May of this year, on managing forest pest information. The report discusses the current reporting dilemma, the expected benefits of a national reporting system, and the initial development of a reporting system, including software requirements.

The core team developed conceptual descriptions of the proposed national reporting system, including application, user interface, and database architecture concepts. These design concepts will be refined as FPM and other potential users provide additional input.

The team recommended that MAG have primary responsibility for the development process. Development in FY 91 will include creating a prototype data base and user interface to be used in conjunction with WO reporting and Region/Area data base planning. This effort is being coordinated with the requirements of

Forest Health Monitoring, led by Bob Loomis in the FPM-WO, and being implemented in the Northeastern Area and Region 8.

In September, FPM-WO met with representatives of several Regional/Area offices to draft a set of data standards for pest incidence reporting. Future work to be accomplished includes a review of the draft by each FPM Region/Area, and having the final set of data standards added to the Forest Service Information Atlas and GIS structure.

For information on INFORMS, JPBWDSS, and Pest Information Management,

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Upcoming Events

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Event	Date	Place	Contact
Prognosis-Pest Model Training	Oct. 16-18	Fort Collins, CO	Bov Eav
Resource Technology 90	Nov. 12-15	Washington, D.C.	Janette Evans
Remote Sensing Workshop	February 4-8, 1991	Fort Collins, CO	Dick Myhre
Data Visualization Techniques Workshop	May 6-10, 1991	Las Vegas, NV	Bill White

Other News

Data Visualization Workshop to be Held in May

The US Environmental Protection Agency is hosting a workshop on Data Visualization Techniques in Natural Resource Management on May 6-10, 1991, in Las Vegas, NV. Representatives from federal natural resource and regulatory agencies, universities, and industry will attend.

The goal of the workshop is to address data visualization in a coordinated and systematic manner to prepare for the future. The workshop will identify a core group of interested subject matter specialists to coordinate discussion, decisions, and work. The workshop will also develop a consensus relative to current and future needs in data visualization.

Several preparatory activities are planned:

- program formulation - evening planning session scheduled at Resource Technology 90
- local arrangements and final program development at the EPA Environmental Monitoring Systems Laboratory, UNLV Campus, Las Vegas, NV, December 4-5, 1990.

The May meeting will include the following activities:

- comprehensive session - two days of papers and discussions to establish the state-of-the-art of data visualization
- concurrent workshops - two days of facilitated sessions tailored to develop current and future needs in specific topic areas, including: data validity representation, equipment, software packages, administrative issues (support, funding, and coordination), and the art of visualization

The final product will be a proceedings of the meeting, including the core group's recommendations for a course of action to meet future needs.

Information on the workshop will be mailed in January 1991. To receive an invitation or additional information, contact one of the following individuals:

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Publications and Reports

"Airborne Video Technology" by Richard D. Myhre, Lee Graham, and Carl Sumpter. Presented at the Third USDA Forest Service Remote Sensing Conference, April 9-13, 1990, in Tucson, AZ. Will appear in the conference proceedings in press for the American Society of Photogrammetry and Remote Sensing.

"Validation of a Mountain Pine Beetle Outbreak Model for Lodgepole Pine in Central Oregon" by Andrew J.R. Gillespie, Janette R. Savidge, Matthew K. Thompson, and Bov B. Eav. USDA Forest Service, Forest Pest Management, Methods Application Group Report: 90-1. Available from MAG (see editor's address on page 4).

"Advanced Technology Task Force Report: Managing Forest Pest Information." USDA Forest Service, Forest Pest Management, Methods Application Group Report: 90-1. MAG participated in the production of this report and has additional copies (see editor's address on page 4).

GPS Technology, cont.

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from Trimble Navigation's Pathfinder GPS receiver unit to the Compix unit (a caption generator) which overlays coordinate data onto the video tape. This information can be used to reference video imagery to a base map using manual methods. During the testing, problems with electronic referencing methods were discovered. The problem has been solved and will be tested later this year. It is now possible to determine within approximately 15-25 meters the center point on video imagery. This range can be improved to 1-5 meters with special

equipment. Now trees are not just trees, but particular trees. Registering aerial survey data to a base map is easily done and the data can be readily input into a GIS for updating the pest coverage.

For information on GPS,

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